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WILDFIRE MANAGEMENT IN THE NORTHWEST TERRITORIES

EXECUTIVE SUMMARY

INTRODUCTION:

In 1979 the Northwest Territories experienced the most severe wildfire season in 30 years of record. A total of 380 fires burned 1,989,130 hectares (4,915,140 ac). The situation was most severe in the Fort Smith District where 179 fires burned 1,402,950 hectares (3,466,690 ac), 70 per cent of the total.

Fires burned unchecked in important trapping and caribou hunting areas east of Fort Smith. One major fire threatened the town of Pine Point for several days. Another fire destroyed 30 per cent of the mature timber in the Slave River valley. Smoke from very large fires seriously obstructed visibility and for several days prevented scheduled commercial aircraft from using the Fort Smith airport. Fire control air operations were also seriously hampered because of smoke. It became difficult at times to detect new fires until they had become very large and impossible to suppress.

There was great and sincere concern expressed by the people of the North about the destruction of vast areas of forest which many depended on for trapping, hunting and a traditional way of life. The Forest Service of the Northern Affairs Program was strongly criticized for failure to provide adequate protection of the resource values at risk.

FIRE REVIEW PANEL:

In response to strong representations made by the Hunters and Trappers Association of Fort Smith and others, the Minister of Indian Affairs and Northern Development appointed an independent Fire Review Panel on November 1, 1979. The Panel was asked to review the fire control operations of the 1979 fire season in the vicinity of Fort Smith and to assess the efficiency of operations, adherence to fire policy, and the adequacy of information dissemination. For the Northwest Territories as a whole, the Panel was requested to review all aspects of fire management policy, criteria, objectives and fire action guidelines.

The Panel undertook a series of public meetings in Fort Smith and 17 other communities, extending to Inuvik in the North and Fort Liard in the southwest corner of the Northwest Territories. The views of all concerned were solicited at informal meetings. We also sought out and met with scientists and representatives of special interest groups in the North. In addition the Panel arranged for several sub-studies to be undertaken on subjects of special concern including reviews of scientific evidence on the

impact of fire on furbearer species, fish, and the socio-economic implications of fire in the North.

The Panel was unable to assess fire damages adequately because winter had arrived in the North by the time the Panel was appointed, and because the Panel's recommendations were required before the 1980 season began. Furthermore, many of the fire effects, such as on furbearer harvests, will not become fully known for a number of years.

#### THE PRESENT POLICY:

The principal objective of the Federal Government's present fire management policy is "to reduce wildfire damages to a level consistent with the present and future needs of the people". There are four major elements to the policy: the criteria used for priority zone determination and delineation; the fire management objectives for each zone; the action guidelines for each zone, and the manner in which these policies are actually implemented.

The policy defines four priority zones for forest fire management. The first priority is devoted to protection of human life and property. Priority Zone 1 includes those areas within 32 km (20 mi) of communities larger than 500 people, and within 16 km (10 mi) of settlements with 25-500 people.

The fire control objective for Zone 1 is to extinguish those fires that could threaten life and property associated directly with the communities.

Priority Zone 2 encompasses areas within 3.25 km of small communities, producing mines, tourist lodges, and narrow strips of land on either side of transmission and communication lines, and major highways. Accessible merchantable timber stands and young stands of trees on highly productive sites are also included.

Fire control objectives for Zone 2 are less specific than for Zone 1. The Department's manual states that: "Fires may (emphasis ours) be actioned if ample justification exists based on assessments of manpower and equipment availability, operational feasibility, anticipated short and long term effects of fire . . . and the alternative uses of limited presuppression and suppression funds."

The majority of natural resource values are assigned to Zone 3, including high value habitat for wildlife, important trapping areas, and high quality but inaccessible timber sites. The fire management objective for Zone 3 is basically the same as that for Zone 2.



Zone 4 includes all other forested land and tundra in an unprotected zone.

The potential advantage of this policy is that it provides for a flexible approach to allow the Forest Service to control wildfires to the extent required for optimum resource management effectiveness. For the last several years, at least, an overriding objective has been to reduce perceived fire suppression overexpenditures in line with the Government's overall fiscal restraint program. In 1976 there was a shrinkage in total area protected in Zones 1, 2 and 3. Beginning in 1977 financial considerations led to the abandonment of Zone 3 as a protected area. As a consequence, much of the trapping and hunting areas important to those who pursue the traditional lifestyle of living off the land were left unprotected.

The people did not seem to understand the policy of the Forest Service. They did not understand how many of their main trapping areas were left unprotected when previous statements of Government had indicated to them that key trapping and hunting areas would receive protection. Government policy seemed to imply to native northerners that the option of living the traditional lifestyles on the land would be maintained as an alternative to entering the wage economy.

A strong positive force is the expressed wish of the people to be involved to a much greater extent - involved in planning and objective setting, and in fire fighting activities so that they can benefit from the development opportunities therein.

#### VALUES AT RISK:

In the study area there are basically two types of communities, those where native northerners make up at least 85% of the population and those where natives account for fewer than 30%. In the first category the economies of the communities are heavily dependent on hunting of country food, primarily caribou and moose, together with fur trapping to provide the necessary cash income to maintain the traditional lifestyle. Few opportunities are available for wage employment in these communities. On a geographic basis these widely scattered communities dominate the region.

The second community category includes the wage economy towns where mineral or oil development or government administration offer employment opportunities. Populations are primarily from southern Canada. Even in these communities, however, there are significant native elements who cling to the traditional way of life.

The major values at risk to damage by fire in addition to communities and structures are caribou winter range, furbearer species habitat, and timber.

To the native people the land and its products are very important. This point was brought out with forceful sincerity in every community visited by the Panel. The major products of concern are meat, largely caribou and furbearers. Where potentially merchantable timber resources existed, these too were identified as important. Since the native culture developed around life on the land and hunting activities in particular, there is great concern that there remain opportunities to allow individuals to choose that way of life and maintain cultural traditions.

#### COUNTRY FOOD AND FURBEARERS:

The rationale frequently put forward in the scientific literature and sometimes by the Department of Indian Affairs and Northern Development is that fire is a natural factor in the environment and that lightning-caused fires have created a mosaic of habitat types in which there is a variety of plant and animal species. From a long range ecological point of view, it has been suggested that nature be allowed to take its course.

The adoption of a "let burn" policy may have been appropriate when native northerners did not live in fixed communities, but migrated with the game they depended upon. Now that they live in fixed communities they suffer losses in terms of time, food and money if major fires occur within traditional hunting and trapping areas.

With respect to the caribou, there are two principle questions. The first is whether or not the overall amount of winter range available to them is a limiting factor to their survival. Evidence available suggests this is not the case, although it could become a factor should the decision be made to try to increase the size of caribou herds in response to rising demands for country food. The numbers of people in the Northwest Territories are substantially greater now too, increasing the demands for all products of the land.

The second factor relates to the cost of hunting. If large fires in or near traditional hunting areas deflect caribou migrations away from NWT settlements, then the hunters would incur increased costs in locating the herds and retrieving their meat supplies. Scientists seem divided on this point. Those who live on the land, however, are convinced that large burned areas, such as those that occurred in 1979, do deflect migrations and may prevent the herds from reaching important unburned portions of the winter range.



Lichen (caribou moss) species make up a very significant part of caribou winter diet. Following fire it takes perhaps 50 years for desirable species to become re-established. Stand ages of between 75-150 years produce the most productive winter ranges for caribou. An average annual burning rate of approximately 1 per cent then should be acceptable to maintain adequate winter range conditions.

The immediate impact of forest fires on harvests of furbearers is fairly easy to judge. Populations drop drastically or are eliminated. Recovery periods vary with the species involved, the size of the burned over area, and the intensity of the fire. In general, the limited scientific evidence available from other areas suggests that water-based species such as beaver, muskrat and mink populations should recover within 5-6 years of fire. Red fox and weasel require up to 10 years, but squirrel and marten seem to require semi-mature forests and may need 25 years or more to repopulate a burned area.

Lynx populations are intimately related to the highly cyclical populations of hare, their major prey species. The impact of fire on lynx may be difficult to separate from the impact of hare population fluctuations. It does appear, however, that lynx may need 20 years to reestablish on large burned over areas.

While these recovery rates are not long from an ecological point of view, they may be disastrously long from the point of view of individual trappers.

With respect to both furbearers and country food the major question is one of determining how much fire is acceptable considering the demands on the resources by the people, the management plans of natural resource agencies, the impact of fires and the costs of fire control. Until such time as more precise scientific direction becomes available the Panel believes that an average annual rate of burning of up to 1 per cent would be acceptable as long as large contiguous areas are not burned over within short spans of years. This should yield a mosaic of vegetation conditions and varied wildlife habitats suitable to most species and should minimize the serious dislocations caused by the occurrence of very large fires. Large areas with average annual burning rates of 2-3 per cent were identified.

#### TIMBER:

There are limited areas of productive forest land in the Northwest Territories, largely confined to the valleys of the Slave, Liard and Mackenzie Rivers. Mature timber stocks in various locations offer an important resource base for present and future economic development of local communities.

The Panel found that when stands of timber are destroyed, the damages estimated by the Department of Indian Affairs and Northern Development were based on the minimal administratively set price for standing timber, a price set low to encourage the harvesting and use of the timber. The Panel does not believe that this is an accurate reflection of real losses. Since there are few areas of productive forest land in the first instance, and since it takes 150 years or more to produce sawlog size timber, we suggest that for all practical purposes those stands of timber represent "perishable non-renewable resources." These resources represent development opportunities, and their loss by fire amounts to development opportunities foregone. Damage estimates should include the present worth of all the potential value-added through harvesting and milling that would also be lost.

#### FIRE MANAGEMENT OPERATIONS IN THE FORT SMITH DISTRICT - 1979:

##### EFFICIENCY OF OPERATIONS:

The Panel believes that many of the criticisms leveled at the Forest Service resulted from concern and frustration of the public seeing large fires burning out of control in Priority Zones 2, 3, and 4 with no significant suppression action being taken by the Forest Service. The apparent shortcomings of the Forest Service were related to the unpopular fire management policy, limited permanent staff and presuppression budget constraints. Within its constraints the Forest Service performed a reasonable task in a very difficult year.

Efficiency in the Fort Smith District was reduced by a weak fire detection system and shortages of fire control supervisors, trained firefighters, air transportation, and by fatigue.

The Panel has made a number of recommendations to solve these problems. Only those that appear most urgent are summarized here.

To fulfill the requirements of a credible fire management operation, supplementary funds are required in 1980 for improved staffing and training and necessary development projects to maintain adequate protection in the present Zones 1 and 2, and to initiate some initial attack capability in Zone 3. In particular, two man-years are required in 1980 to provide for a fire behaviour specialist, and an aircraft dispatcher.

To remove the known deficiencies in the fire detection system, one new fire lookout is required in the Pine Point area and existing fire lookouts in the Fort Smith District should be manned in 1980.



One aircraft used for fire detection patrols should be equipped with an infra red scanner to permit detection when visibility is reduced by smoke.

Training and certification programs for firefighters and supervisors need major expansion with emphasis placed on employment of native people.

#### ADHERENCE TO POLICY:

The Panel did not find evidence to indicate that the Fort Smith District staff failed to follow the Department's fire management policy except with respect to fire control in Zone 3. The problem is primarily with the policy itself and the public's understanding of it. The policy provides for changes in protection levels in Priority Zones 2, 3, and 4 depending on fire loads in higher priority areas, availability of men and equipment and the rationing of limited funds. In 1979, all three factors came into play. There were serious fires and a high risk of others in Zone 1. There was a large number of fires burning at one time in Zones 1 and 2. The Forest Service assessment of budgetary constraints prompted the removal of Zone 3 from protected status in 1977. The Panel is concerned that this decision appears to be in conflict with the Department's official policy.

The financial constraints placed on the Forest Service contributed to its inability to meet the Department's objective. The basis for policy development and implementation should be based primarily on natural resource management objectives rather than financial management objectives as discussed elsewhere in this summary.

#### DISSEMINATION OF INFORMATION:

The Panel heard testimony and studied statistics, fire reports, maps and files of the Forest Service offices in Fort Smith. There were gaps in information, errors in records and sometimes conflicting statistics, but all were of a minor nature. There was no evidence of any attempt to deliberately mislead the public or the Minister. Greater efforts should have been made, however, to reach the public and keep it informed of the fire situation. They lacked successful communication with the Fort Smith Hunters and Trappers Association and many native groups.

There was a deep misunderstanding of the word "disaster"



applied to the large areas of burn east of Fort Smith. For the hunters and trappers affected, the situation was a disaster. For others not affected directly it had disastrous implications by demonstrating what would happen in other areas without a fundamental policy change. The Forest Service did not consider it to be a disaster because of their interpretation of the fire management policy.

The credibility of the Forest Service suffered seriously in 1979. Forest Service staff in the Fort Smith District must visit every community before and during the 1980 fire season to advise the public of their plans, to listen to concerns, and to respond to concerns.

Improved communication with all elements of the public must be made an important objective for the Forest Service staff.

#### RECOMMENDED POLICY GUIDELINES:

The Panel's review of fire management policies in the Northwest Territories together with a specific review of fire operations in the Fort Smith District has yielded a proposed set of fire management objectives, together with some 90 policy guideline recommendations designed to meet these objectives.

#### FIRE MANAGEMENT OBJECTIVES:

The major objectives for wildfire management must be:

- a) To protect human life and property.
- b) To protect natural resources to the degree that meets the requirements of natural resource management agencies and reflects the interests of the people.

It is essential that the agencies responsible for managing resources determine their own objectives and, in particular, their needs with respect to fire control. Their requirements supported by socio-economic justification must be supplied to the Forest Service if it, in turn, is to develop an appropriate fire management plan and obtain the funds to carry it out.

#### PUBLIC INVOLVEMENT:

The Panel encountered high levels of frustration among



native northerners who felt that their interests in the protection of natural resources from fire were either misunderstood or ignored by the Forest Service. More effective consultation is required on both formal and informal bases.

A Forestry Advisory Board for the Northwest Territories should be established to provide a means of providing advice on objectives and priorities of fire management. Membership on the Board should include representatives of the Forest Service, the GNWT Fish and Wildlife Service, Hunters and Trappers Association, Dene Nation, Metis Association, NWT Grade Stamping Association and others with particular interests in the land.

Local Advisory groups should be set up at the community level to discuss and advise on district matters.

#### FIRE MANAGEMENT ZONES:

The present four priority zones governing wildfire management should be scrapped and replaced with two - a Fire Attack Zone and an Observation Zone.

Within the Fire Attack Zone, the Forest Service must have the capability for prompt detection, initial attack and control of fires before fire intensity begins to build on the second day of a fire.

Fires that escape initial attack control should receive sustained attack until controlled when any communities or major properties are threatened or when potentially merchantable timber stands in the Slave River and Liard Timber Management Units are threatened. In all other areas fires that escape attack should be assessed in light of circumstances and strategy options to determine what, if any, additional action should be taken.

Delineation of all the areas containing resource values deserving initial attack protection, and an implementation schedule will be an exacting task. It should be done in close consultation with the community advisory groups. Initial attack capability should be extended to: identified key trapping areas; lands with high potential for timber growth, watershed values, or erosion risks; and critical areas of caribou winter range.

The Forest Service should be prepared to provide defensive fire control action to isolated homes, lodges, and camps. Defensive action could include the loaning of fire fighting equipment for self-help attack on nearby fires, burning out in front of advancing



fires, advice on fuel reduction programs to reduce risks around habitations and evacuations if required.

The Panel has identified three areas where recent fire history has caused an excessive rate of burns, and where initial attack capability should be extended at least on an interim basis until the average annual rate of burning becomes less than 1 per cent. Beginning in 1980 a start should be made to extend initial attack into approximately 39,000 square kilometers east of the Taltson River south of Great Slave Lake, an area of some 65,000 square kilometers north and west of Yellowknife, and the central portion of the Horn plateau.

The Observation Zone should include those areas where little use is being made of the land or where the average annual rate of burning has been within acceptable limits of less than 1 per cent. In this Zone fires would be observed and action taken only if higher value areas appeared in danger and opportunities occurred to stop or divert the advance of the fire by burning out from natural fire breaks around the fire.

#### FIRE DETECTION:

Rapid fire detection is essential to the success of an initial attack fire suppression policy. It is urgently important for the Forest Service to develop a comprehensive fire detection plan to include a combination of fixed lookouts, aerial patrols, and directional lighting detectors.

In 1980 high priority should be given to development of an emergency detection plan to provide for the use of temporary lookout facilities and increased aerial patrols with at least one aircraft fitted with an infra red scanner to allow fires to be detected when visibility is reduced by smoke.

#### MANPOWER REQUIREMENTS:

It is impossible to state full staffing requirements until the Forest Service develops an approved fire management plan based on the Panel's recommendations. However, the Panel has identified some serious deficiencies that should be overcome in 1980. Some have already been indicated in the review of operations in the Fort Smith District.

Immediate new requirements include three five-man seasonal suppression crews supported by helicopter or float plane transportation and fixed wing aerial detection patrols. The crews



should be stationed in the Fort Smith area, Yellowknife and Fort Simpson. Their primary task would be to begin an initial attack capability on the three special areas identified by the Panel, other key trapping areas to be identified in consultation with community advisory groups, and to add necessary support to the existing organization in protecting communities and areas supporting merchantable timber.

#### PLANNING:

Planning for years of extreme fire conditions that exceed normal resources is essential. The Forest Service must have the flexibility and financial support to act in anticipation of severe fire loads. A trained pool of firefighters must be developed in each District. Mutual support agreements with neighbouring jurisdictions should be updated. More flexible accounting procedures should be adopted to allow movement of men and equipment into strategic areas in anticipation of fire outbreaks.

#### CONCLUSION:

This executive summary highlights the major findings and recommendations of the Panel's report on fire management policies and operations in the Northwest Territories. The Forest Services' capability is in an early developmental stage. The 1979 fire season was particularly hazardous and would have been a difficult challenge even to a more mature and better equipped organization. If the traditional lifestyle option is to be maintained for native northerners the planned and scheduled development of a better equipped, more effective fire management agency involving native people is important. The cost-effectiveness of a strong initial attack capability is recommended as the most attractive option for most areas where resource values require protection.

Overriding all is the essential need for a fire management plan based on the needs of the people and involving them in its preparation and budget support to implement the plan.





FOREST FIRE REVIEW PANEL  
BIOGS OF MEMBERS

Government  
Publications

Peter J. Murphy (Chairman)

Education:

- General science program, McGill University, 1947-49
- B.Sc. in Forestry, University of New Brunswick, 1953
- M.Sc. in Forestry, University of Montana, 1953
- Nuffield Travelling Fellowship to study Renewable Resource Management in Great Britain, 1968

Experience:

- Forester-in-training with B.C. Forest Service, 1953-54
- Forest Engineer, Alberta Forest Service, 1954-55
- Management forester, Eastern Rockies Forest Conservation Board, 1955
- Head of Training Branch, Alberta Forest Service, 1956-72 (including work on developing the fire control training program)
- Dept. of Forest Science, University of Alberta, 1973 (Chairman 1974, Professor 1976, Associate Dean Forestry 1978)

Professional:

- Member, Canadian Committee on Forest Fire Control (CCFFC) (Associate Committee of National Research Council; Chairman Subcommittee on fire control training; Member NRC committee in University Forestry Research; Member of Research Sub-committee on Forest Fire Control advisory to Canadian Forestry Service)
- Member, Canadian Institute of Forestry (CIF); Chairman; Rocky Mountain Section CIF 1960-61; National Board of Directors CIF 1961-62; Member of National Committee on Forest Policy 1974-75

Personal:

- Born February 20, 1930, Montreal, Quebec
- Married, 5 children aged 8 to 21 years
- Enjoys hunting, fishing, skiing, camping, woodworking
- Address: University of Alberta  
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FOREST FIRE REVIEW PANEL  
BIOGS OF MEMBERS ..2

Stan R. Hughes

Education: - Graduate in forestry (B.S.F.), University of British Columbia

Experience:

- Worked with the government of Alberta Forest Service for 25 years, including Administrative Officer of the Eastern Rockies Forest Conservation Board, Forest Superintendent, Officer-in-Charge of Forestry Construction, Senior Superintendent of Forest Surveys and Head of Forest Protection 1964-74
- Executive Assistant to the Alberta Deputy Minister of Renewable Resources 1975
- Consultant on all aspects of forest protection from uncontrolled fire, including protection of municipal watersheds and resource towns from wildfire.  
Worked on Canadian International Development Agency Projects:
  - Fire emergency in Republic of Columbia, 1973
  - Forest protection projects in Honduras 1976, 77, 78

Professional:

- Member of the Canadian Committee on Forest Fire Control for 10 years and National Chairman 1968-71
- Member of the Fire Management Working Group of the North American Forestry Commission for three years
- Member of the Canadian Institute of Forestry
- Member of the American Society of Foresters

Personal:

- Married
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FOREST FIRE REVIEW PANEL  
BIOGS OF MEMBERS ..3

John S. Mactavish

Education:

- B.Sc. Forestry, University of New Brunswick, 1953
- M.S. Resource Economics, Suracuse University and State of New York University College of Forestry, 1959

Experience:

- Canada Department of Forestry (forest economics research and forest fire control research) 1953-65
- Canada Department of Energy, Mines and Resources 1965-70
- Canada Department of the Environment, Director of Federal Provincial Relations 1970-73
- Deputy Minister, Nova Scotia Department of the Environment 1973-77
- Deputy Minister, Nova Scotia Department of Lands and Forests January 1, 1978 to June 30, 1979
- Private consultant

Personal:

- Born March 2, 1931, Montreal, Quebec
- Married
- Address: Box 118, Waverley, N.S. B0N 2S0









